The Bendix® Wingman® ACB System
Active Cruise with Braking

Operator's Manual

⚠WARNING

⚠ WARNING: Improper use of the Bendix® Wingman® ACB system can result in a collision causing property damage, serious injuries, or death. Be sure to read, understand, and follow all these instructions carefully.

⚠ WARNING: The driver is always responsible for the control and safe operation of the vehicle at all times. The Bendix Wingman ACB system does not replace the need for a skilled, alert professional driver, reacting appropriately and in a timely manner, and using safe driving practices.

DO NOT REMOVE FROM VEHICLE

This booklet contains important operational and safety information that benefits you and subsequent drivers.

Where to find additional information about the Bendix® systems on your vehicle

1. Consult the vehicle manufacturer's documentation.
2. Visit www.bendix.com for free downloads of the Service Data sheets listed below, or order paper copies of these publications from the Literature Center at www.bendix.com.

   • SD-13-3333 Bendix® Wingman® ACB Service Data Sheet

   • SD-13-4869 Bendix® EC-60™ ABS/ATC/ESP Controllers (Advanced) Service Data Sheet

3. Contact the Bendix Tech Team at techteam@bendix.com or call 1-800-AIR-BRAKE (1-800-247-2725). Representatives are available Mon.-Fri. 8:00 a.m. to 6:00 p.m. EST.

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Important Safety Information About Bendix® Wingman® ACB

SECTION 1: GENERAL

The driver is always responsible for the control and safe operation of the vehicle at all times. The Bendix® Wingman® ACB system does not replace the need for a skilled, alert professional driver, reacting appropriately and in a timely manner, and using safe driving practices.

Use cruise control only in the conditions that are normally recommended for its use.

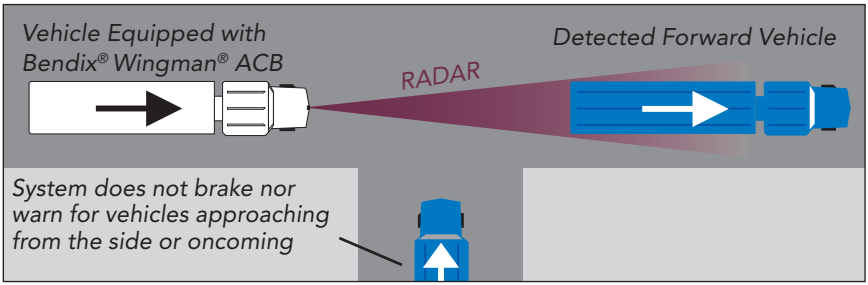
Setting the cruise control will also set the active cruise control with braking feature of the Bendix Wingman ACB system. It must never be used on roads where you can not drive safely at a steady speed, including city streets, winding roads and sharp curves, downhill grades, poor road conditions (such as gravel or dirt), ice or wet surfaces (wet surfaces may increase the risk of hydroplaning), or in fog, heavy rain or snowy conditions.

Also, the cruise control should not be used in inclement weather; dense traffic or where smaller vehicles – such as motorcycles – are ahead in the same lane.

Always switch off the cruise control (by stepping on the brakes or turning off the cruise control switch) when entering turning lanes, entering or exiting highways, driving through construction zones, or similar situations. See page 23 for more details.

Variations from this Manual – Vehicle manufacturers, and some previous models of the Bendix Wingman ACB system, may use alerts, messages, and dash arrangements that vary from the examples shown here. Consult the vehicle operator's manual(s) for applicable details regarding use and operation.

The Bendix® Wingman® ACB system reacts ONLY to vehicles moving in the same direction as your vehicle. The Wingman ACB system DOES NOT respond to side-to-side moving traffic, or oncoming traffic. The system WILL NOT slow your vehicle or provide an alert as you approach vehicles in these circumstances.


Vehicle Equipped with Bendix® Wingman® ACB
RADAR
Detected Forward Vehicle
System does not brake nor warn for vehicles approaching from the side or oncoming

When the Wingman ACB system needs to intervene, it works in conjunction with the Bendix® ESP® full stability system to engage the brakes. **The system should never be relied upon to stop your vehicle or to avoid a collision.** The driver can, and should, still apply full braking force, if needed.

SECTION 2: DRIVER ALERTS & WARNINGS

Driver Alerts and Warnings – Before driving with Wingman ACB, the driver should fully understand all the audible alerts and visual indicators that the system provides. This booklet will assist in explaining what each of them means. **Any audible and/or visual alert by the system means that your vehicle is too close to the vehicle ahead and the driver must immediately act to potentially avoid — or lessen the severity of — a collision.**

The Impact Alert (IA) is the most severe alert issued by the Wingman ACB system. This alert indicates that a collision with the detected forward vehicle is likely and the driver must immediately act to potentially avoid — or lessen the severity of — a collision. The Impact Alert is ready to alert the driver whenever the vehicle is moving above 15 mph (24 km/h).

When activated, the IA will sound and a visual message/icon typically appears on the dash screen or Bendix® Driver Interface Unit (DIU) display. The actual sound/display method varies by vehicle manufacturer.

The Following Distance Alert (FDA) provides both audible and visual alerts whenever the time between your vehicle and the vehicle ahead is less than one and a half (1½) seconds* and getting closer. Once the audible alert is given, the driver should increase the distance between his/her vehicle and the vehicle ahead until the audible alert stops. The FDA is ready to alert the driver whenever the vehicle is moving above 5 mph (8km/h). If the following distance continues to decrease, the driver will hear more rapid audible alerts. When the FDA reaches its highest level, typically a red LED also illuminates on the instrument cluster. The FDA may be accompanied by a visual alert.

* 1½ seconds is the system default and may vary by fleet/OEM.

Stationary Object Alert (SOA) – The Bendix® Wingman® ACB system will give up to three (3) seconds alert time when approaching a detected, sizable, stationary object with metallic (radar-reflective) surfaces in your lane of travel. This alert indicates that a collision with a stationary object is likely and the driver must immediately act to potentially avoid — or lessen the severity of — a collision. The SOA is ready to alert the driver whenever the vehicle is moving above 10 mph (16 km/h).

The driver should be especially careful when approaching certain types of vehicles and objects. The Wingman ACB radar may not be able to detect objects with limited metal surfaces (such as recreational vehicles, horse-drawn buggies, motorcycles, logging trailers, etc). *NOTE: Entering a curve may reduce the alert time to less than three (3) seconds.*

Pedestrians, Animals, Non-metallic or Limited-metallic Objects – The Wingman ACB system will not warn or react to pedestrians, animals, and non-metallic objects. The system may not warn or react to limited-metallic objects (such as recreational vehicles, horse-drawn buggies, motorcycles, logging trailers, etc).

Other Metallic Objects – Other objects that the radar may detect in, or close to, the vehicle's path (such as crash barriers, guard rails, construction zone barricades, tunnel entrances, etc.) may impair the function of the radar.

Brake Overuse Alert - The Bendix® Wingman® ACB system provides a warning when the system is intervening and using the foundation brakes excessively. Overuse of the foundation brakes can lead to the brakes overheating and a potential loss of braking performance caused by brake fade. Using cruise control on downhill runs will cause this alert to be activated.

Approach grades as you would normally, with the appropriate gear selected and at a safe speed.

Cruise control should NOT be used on downhill grades.

When the system detects brake overuse, depending on the vehicle manufacturer, a text message will be displayed on the dashboard and an audible alert will be activated. The driver should intervene immediately.

- Once the brake overuse alert is activated, certain driver interventions that cancel cruise control – like stepping on the brake pedal or switching off cruise – will discontinue the alert. Following an overuse alert, the driver should not reset the cruise control for at least 20 minutes. This gives the brakes time to cool down. If the driver chooses to reset cruise control during that 20 minute period, Wingman ACB interventions will be limited to de-throttling and the engine retarder only. The system will automatically disable all Wingman ACB system foundation brake applications for at least 20 minutes.
- If the system does not detect a driver intervention within 15 seconds after the brake overuse alert sounds, it will shut itself off and set a Diagnostic Trouble Code (DTC). The driver will continue to receive alerts, but ALL Wingman ACB interventions (de-throttling, engine retarder or brake applications) will be disabled until the next ignition cycle.

Note: In all cases, the driver still has the ability to apply the foundation brakes if necessary. The driver should take care since overheated brakes may reduce the vehicle's braking capability.

SECTION 3: EQUIPMENT MAINTENANCE

Importance of Antilock Braking System (ABS) Maintenance – Optimal Bendix® Wingman® ACB system braking requires a properly maintained ABS system, without any active ABS Diagnostic Trouble Codes (DTCs). Have active DTCs repaired by a qualified technician. Any ABS DTCs will cause the Wingman ACB system to deactivate.

Importance of Brake Maintenance – Optimal Wingman ACB braking requires properly maintained vehicle foundation brakes (drum, wide-drum, or air disc) which meet appropriate safety standards and regulations. Brake performance also requires that the vehicle be equipped with properly sized and inflated tires with a safe tread depth.

System Problems – If a problem with the Wingman ACB system is detected, depending on the vehicle manufacturer, typically there will be a message on the dashboard display. Depending on the type of problem detected, the system will determine if the vehicle may continue normal cruise control functions (without the benefits of Wingman ACB), or whether all cruise control functions should be disabled until service is performed. The system should be serviced as soon as possible to restore full Wingman ACB functionality.

Radar Inspection – The driver should inspect the radar and mounting bracket regularly and remove any mud, snow, ice build-up, or other obstructions. The installation of aftermarket deer guards is not recommended, and could impair the operation of the radar.

Radar Damage / Misalignment / Tampering – In cases where the bumper and/or radar have sustained any damage, are misaligned, or if you suspect that the radar has been tampered with, do not use the cruise control until the vehicle has been repaired and the radar re-aligned. In addition, an indicator on the dash typically will illuminate if the system detects any of these conditions. Consult your vehicle's operator's manual or contact Bendix for more information.

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Congratulations on Your Purchase!

You are now using one of the latest advances in commercial vehicle technology, the Bendix Wingman ACB system. This Operator's Manual will explain the features and functions of this innovative technology, enabling you to gain the maximum performance from the system.

Please read this manual thoroughly before operating the system. Familiarize yourself with the controls, the various system alerts, and what to expect when the system operates. Always keep this manual in the vehicle and use it as a reference for any questions you may have about the system, its operation and performance characteristics.

Thank you for your purchase of the Bendix Wingman ACB system.

The Bendix® ESP® Stability System

All vehicles equipped with the Bendix® Wingman® ACB system are also equipped with the Bendix® ESP® stability system. The Bendix ESP stability system is an always ready, full-stability system which monitors vehicle performance and, when necessary, automatically intervenes to reduce the throttle and/or apply the foundation brakes to help you maintain stability during potential loss-of-control or rollover events.

The Wingman ACB system uses the ESP system to help maintain vehicle stability during automatic brake applications on slick surfaces.

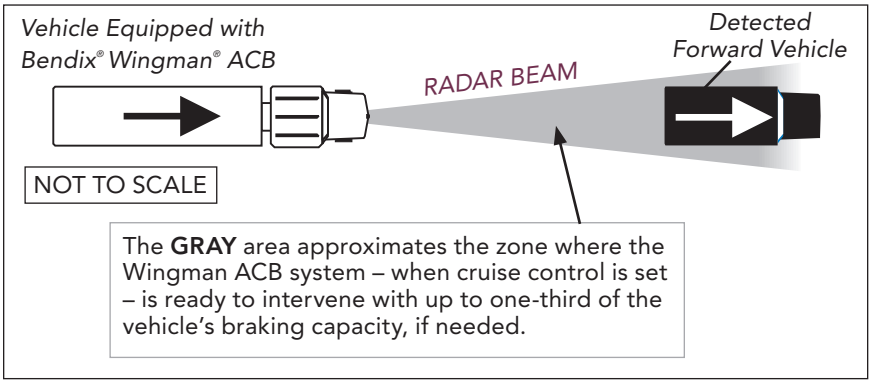
The Bendix ESP stability system and the Wingman ACB system do not replace the need for the driver to remain alert, react appropriately and in a timely manner, and use safe driving practices.

The Bendix® Wingman® ACB System Overview

The Bendix® Wingman® ACB system is an integrated combination of three features:

- Active cruise control with braking;
- Alerts (three types of alerts); and
- Collision mitigation technology.

See the diagram below.


Vehicle Equipped with Bendix® Wingman® ACB
Detected Forward Vehicle
RADAR BEAM
NOT TO SCALE
The GRAY area approximates the zone where the Wingman ACB system – when cruise control is set – is ready to intervene with up to one-third of the vehicle's braking capacity, if needed.

What Features are Included in the Bendix Wingman ACB system?

Part One: Active Cruise Control with Braking

Think of the active cruise control with braking feature as an additional upgrade to ordinary cruise control. When using cruise control, your vehicle not only will maintain the set speed, but the system also will intervene, as needed, to help maintain a set following distance behind the vehicle in front of you.

Using a radar (with a range of approximately 500 feet) mounted to the front of your vehicle, the Wingman ACB system reacts ONLY to vehicles moving in the same direction as you. (The system DOES NOT respond to side-to-side moving traffic or oncoming traffic.)

See the GRAY area in the diagram above. The active cruise control with braking feature is designed to help maintain a set following distance between your vehicle and the vehicle ahead when cruise control is set.

Once cruise control is set and the system is maintaining a set following distance between you and the vehicle in front:

- **If the vehicle in front of you slows down** below your cruise control's set speed, the system will intervene, as necessary, in this order:
  (a) reduce the engine throttle; then
  (b) apply the engine retarder; then
  (c) apply the foundation brakes,
  in an attempt to maintain the set following distance behind the vehicle ahead. *NOTE: If, during the intervention it is necessary to apply the foundation brakes, the vehicle will not automatically resume the cruise control set speed.*
- **If the vehicle ahead slows — below your cruise control's set speed — but then accelerates away**, and the Bendix® Wingman® ACB system did not need to use the foundation brakes, the system will automatically accelerate back to the original cruise control set speed. It will again maintain a set following distance behind any vehicles that are ahead of you.

Because the Wingman ACB system operates along with normal cruise control, all the typical features built into cruise control work as usual. For example, limits imposed by factory-set road speed governors, etc. are fully supported by the Wingman ACB system.

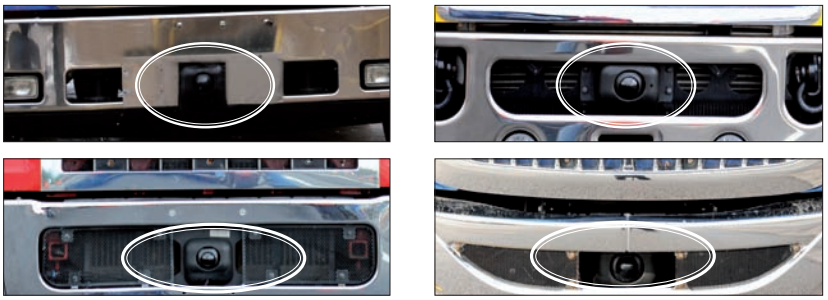
Part Two: Alerts

Bendix Wingman ACB also assists by giving audible and visual alerts, whether or not cruise control is on. See Pages 20-21 for more information on the three types of alerts you may hear and/or see displayed.

The Bendix® Wingman® ACB System Components

The Bendix® Wingman® ACB radar locates and tracks moving vehicles. The radar is located at the front of your vehicle – either on the bumper or just behind it on a cross-member. When located behind the bumper, in some cases the unit also may be behind a protective covering that allows the radar signal to pass through.

The Bendix Wingman ACB radar is pre-aligned at the factory and no adjustment should be needed. If the radar becomes misaligned, (or any other system problem is detected) a message — or light on the dash — lets the driver know that service is needed.



Above: Examples of radar locations.

System Display

Driver information about the Wingman ACB system is either fully integrated into the vehicle dashboard, or uses the Bendix® Driver Interface Unit (DIU). Although the system functions the same, how the alerts are displayed to the driver can be different. See the *Alerts and Warnings* section of this manual on pages 20-22 for more detailed information about the alerts.

Bendix® Driver Interface Unit (DIU)

NOTE: For some integrated systems, the volume level of the alerts is not adjustable, nor can they be switched off.

The Active Cruise Control with Braking Feature

NOTE: Whenever the cruise control is set, the active cruise control with braking feature is also set.

Setting Cruise Control

Examples of cruise control switches

First, switch on the cruise control. Accelerate your vehicle to the cruise control speed you wish to maintain, then press the cruise control set switch. The active cruise control with braking feature is now ready and will help you maintain a set following distance.

Once the cruise control speed is set, a green cruise-enabled icon (or similar) will illuminate on the instrument panel. If the cruise-enabled (or similar) icon does not illuminate, the cruise control is not functioning normally. Please refer to your vehicle operator's manual to double-check the location of the icon and for further troubleshooting information.

Some vehicle manufacturers use the instrument cluster to momentarily show the cruise control set speed to the driver.

Where the Driver Interface Unit (DIU) display is used, a text message will provide the set speed information.

The driver can switch the active cruise control with braking feature off manually by either stepping on the brake, or by switching OFF the cruise control.

Example of Driver Interface Unit (DIU) detected forward vehicle display

NOTE: Cruise control will automatically cancel whenever the Bendix® Wingman® ACB system applies the foundation brakes. You can verify the system is disengaged by observing that the cruise-enabled icon is no longer illuminated. *You must resume or set cruise control in order to regain normal cruise control functionality and to re-engage the active cruise control with braking feature of the Wingman ACB system.*

The Forward Vehicle Detected Icon

When the cruise control is switched on and set, and a vehicle ahead of you is detected by the radar, the forward vehicle detected icon (or similar) on the vehicle dashboard will illuminate.

This is an indication to the driver that the Wingman ACB system is actively managing the distance between your vehicle and the vehicle ahead, and that the system may automatically intervene.

Adjusting the Cruise Control Speed

Use the switch(es) provided by the vehicle manufacturer to set your cruise control speed. When adjusted, your set speed will typically be indicated on the vehicle dash, message center, or speedometer, etc.

What is Following Distance?

Following distance refers to the time gap – measured in seconds – between the vehicle with Wingman ACB and the vehicle ahead. The actual physical distance between the two will vary based on the speeds of both vehicles; however, the set gap will remain the same for all set cruise speeds.

Automatic Foundation Brake Applications

The vehicle automatically manages foundation braking priorities among the various vehicle systems that use the foundation brakes, such as Wingman ACB, Bendix® ESP® (Electronic Stability Program), Bendix® ATC (Automatic Traction Control), and Bendix® ABS (Antilock Braking System).

What to Expect When Using the Bendix® Wingman® ACB System

The charts on the next page illustrate what to expect from the Wingman ACB system in various driving situations you may encounter. Both the system indication and action to expect from the system are illustrated.

What to Expect		
Section One: All driving scenarios (Cruise is either "ON" or "OFF")		
Situation	**Typical System Indication/Alerts**	**Typical System Actions**
A broken-down vehicle is stationary in the lane in which your vehicle is traveling.	A Stationary Object Alert may be issued up to three (3) seconds prior to impact.	None.
A pedestrian, deer or dog runs in front of your vehicle.	None.	None.
Another vehicle crosses the road perpendicular to your path of travel – such as at an intersection.	None.	None.
The detected forward vehicle slows rapidly.	The Impact Alert (continuous tone) will sound and a visual message/icon typically appears on the dash screen or DIU display.	None. **The driver must immediately act to potentially avoid — or lessen the severity of — a collision.**

What to Expect		
Section Two: Cruise control "ON" and speed "SET"		
Situation	**Typical System Indication/Alerts**	**Typical System Actions**
With no detected forward vehicle.	None.	Vehicle maintains set speed.
With a detected forward vehicle.	The cruise control ON indicator is illuminated and the detected forward vehicle icon is illuminated.	The active cruise control with braking feature will maintain the set speed or following distance.
The detected forward vehicle slows moderately.	The Following Distance Alert (FDA) will sound and a visual message/icon typically appears on the dash screen or Bendix® Driver Interface Unit (DIU) display.	The vehicle will be slowed by (in order) (a) reducing throttle; (b) engaging the engine retarder; or (c) applying the foundation brakes. If the foundation brakes are applied, cruise control is cancelled.

What to Expect		
Section Two (continued): Cruise control "ON" and speed "SET"		
Situation	**Typical System Indication/Alerts**	**Typical System Actions**
The detected forward vehicle slows rapidly.	The Impact Alert (IA) warning (continuous tone), will sound and a visual message/ icon typically appears on the dash screen or DIU display. The Following Distance Alert may also be heard.	The vehicle throttle will be reduced; the engine retarder engaged; and up to one-third of the vehicle's braking capacity will be applied. The cruise control feature cancels after the event.
If a detected forward vehicle cuts in front of your vehicle and speeds away.	The Following Distance Alerts may be given to the driver, depending on the exact system configuration that has been set for the vehicle, and how close the vehicle cuts in front.	Vehicle maintains set speed.
Going down a grade with a detected forward vehicle. **Cruise control should *NOT* be used on downhill grades.** See the CDL manual instructions on proper gear usage for downhill grades.	DO NOT USE cruise control on downhill grades.	DO NOT USE cruise control on downhill grades.

NOTE: The system indicators/alerts shown are typical, but may vary from the descriptions shown here by vehicle manufacturer, or earlier versions of the Bendix® Wingman® ACB system.

What to Expect (continued)		
Section Three: Cruise control speed NOT "SET", or "OFF"		
Situation	**System Indication/Alerts**	**Typical System Actions**
If your vehicle comes up fast behind a slower-moving detected forward vehicle.	The Following Distance Alert (FDA) will sound and a visual message/icon typically appears on the dash screen or DIU display. Depending on how close your vehicle approaches, the system may initiate an Impact Alert.	None. **The driver must immediately act to potentially avoid — or lessen the severity of — a collision.**
The detected forward vehicle slows rapidly.	The Following Distance Alert (FDA), or Impact Alert (continuous tone) will sound and a visual message/icon typically appears on the dash screen or DIU display.	None. **The driver must immediately act to potentially avoid — or lessen the severity of — a collision.**

NOTE: The system indicators/alerts above are typical, but may vary from the descriptions shown here by vehicle manufacturer, or earlier versions of the Bendix® Wingman® ACB system.

NOTE: These are examples of situations and typical Wingman ACB system responses. However, this chart does not attempt to cover all possible situations.

The driver is always responsible for the control and safe operation of the vehicle at all times. The Bendix Wingman ACB system does not replace the need for a skilled, alert professional driver, reacting appropriately and in a timely manner, and using safe driving practices.

How Your Actions Impact the Bendix® Wingman® ACB System

The following chart illustrates how the Bendix® Wingman® ACB system will react to various actions you may initiate.

If you do this:	Typical Wingman ACB system responses:
Step on the brake. (During an ACB event.)	The driver is always in control and is able to apply full braking force (assuming a properly maintained vehicle).
Step aggressively on the accelerator. (During an ACB event.)	The driver is always in control. His/her actions override any Wingman ACB system actions. Note: If cruise control is engaged, it will be overridden until the accelerator is released; then cruise control will resume the original set speed automatically.
Step on the brake. (When in cruise.)	Cruise control will be cancelled.
Step on the accelerator. (When in cruise.)	Cruise control will be overridden until the accelerator is released; then cruise control will resume the original set speed automatically.
Switch "ON" the cruise control.	Nothing. The active cruise control with braking feature will not engage until the driver sets the cruise control speed.
Switch "OFF" the cruise control.	The active cruise control with braking feature will turn off; the collision mitigation feature remains ready to intervene. The driver will continue to hear all alerts as needed.
Set the cruise control speed.	The active cruise control with braking feature is automatically activated, and your vehicle maintains set speed and following distance behind the vehicle ahead.
Cover or block the radar.	The Wingman ACB system performance will be diminished — or even disabled — and a Diagnostic Trouble Code (DTC) will be set. A blockage will also affect engine cruise control availability.
Use normal cruise control "+/-" switch.	Vehicle speed increased (+) or reduced (-) to achieve the new set speed while actively maintaining the following distance with the vehicle ahead, if one is present within 500 feet.

NOTE: The system responses above are typical, but may vary from the descriptions shown here by vehicle manufacturer, or earlier versions of the Wingman ACB system. These represent examples of driver actions and typical Wingman ACB system responses, however this chart does not attempt to cover all possible situations.

Alerts and Warnings

The Bendix® Wingman® ACB system is a unique patented system that functions differently than other cruise control/forward collision alert and mitigation systems. It is important for ***YOU*** to fully understand the system's features, especially the driver indications and alerts.

Three main alerts provided by the Wingman ACB system are the **Impact Alert (IA), Following Distance Alert (FDA), and Stationary Object Alert (SOA)**. All of the alerts are always ready to alert the driver, whether or not you are using cruise control.

WARNING: Any audible and/or visual alert by the system means that your vehicle is too close to the vehicle ahead and the driver must immediately act to potentially avoid — or lessen the severity of — a collision.

The Driver Alerts and Warnings

Impact Alert (IA)

- **Always ready**

Above: Bendix® Driver Interface Unit (DIU) - Showing Impact Alert warning - a loud continuous tone will also sound.

Below: Examples of other vehicle manufacturer's displays.

The Impact Alert is the most severe warning issued by the Wingman ACB system. This alert indicates that a collision with the detected forward vehicle is likely and the driver must immediately act to potentially avoid — or lessen the severity of — a collision.

The Impact Alert is ready to alert the driver whenever the vehicle is moving **above 15 mph (24 km/h)**.

When activated, the IA will sound and a visual message/icon typically appears on the dash screen or Bendix® Driver Interface Unit (DIU) display. The actual sound/display method varies by vehicle manufacturer.

NOTE: The Impact Alert is typically accompanied by automatic brake interventions when cruise is set. The Wingman ACB system will apply up to one-third of your vehicle's braking capacity. The driver must apply additional braking, when necessary, to maintain a safe distance from the vehicle ahead.

Following Distance Alert (FDA)

- **Always ready**

Above: Driver Interface Unit (DIU) - Showing Examples of Following Distance Alerts - with progressively faster audible alerts.

The Following Distance Alert (FDA) provides both audible and visual alerts whenever the distance between your vehicle and the detected forward vehicle ahead is less than the one and a half (1½) seconds* and getting closer. Once the audible alert is given, the driver should increase the distance between his/her vehicle and the vehicle ahead until the audible alert stops.

The FDA is ready to alert the driver whenever the vehicle is moving **above 5 mph (8km/h)**. If the following distance continues to decrease, the driver will hear more rapid audible alerts. When the FDA reaches its highest level, typically a red LED also illuminates on the instrument cluster. The FDA may be accompanied by a visual alert.

Above: Examples of other vehicle manufacturer's displays.

* 1½ seconds is the system default and may vary by fleet/OEM.

Stationary Object Alert (SOA)

- **Always ready**

DIU: Showing Stationary Object Alert - a continuous tone will also sound.

NOTE: Entering a curve may reduce the alert time to less than three (3) seconds.

Stationary Object Alert (SOA) – The Bendix® Wingman® ACB system will give up to three (3) seconds alert time to the driver when approaching a detected, sizable, stationary object with metallic (radar-reflective) surfaces in your lane of travel. This alert indicates that a collision with a stationary object is likely and the driver must immediately act to potentially avoid — or lessen the severity of — a collision.

The SOA is ready to alert the driver whenever the vehicle is moving **above 10 mph (16 km/h)**. The driver should be especially careful when approaching certain types of vehicles and objects. The Wingman ACB radar may not be able to detect objects with limited metal surfaces (such as recreational vehicles, horse-drawn buggies, motorcycles, logging trailers, etc).

Special Alerts

Brake Overuse Warning – The Bendix® Wingman® ACB system provides a warning when the system uses the foundation brakes excessively. Overuse of the foundation brakes can lead to the brakes overheating and a potential loss of braking performance caused by brake fade.

Approach grades as you would normally, with the appropriate gear selected and at a safe speed. Cruise control should *NOT* be used on downhill grades. The driver should use appropriate gearing and brake techniques on downhill grades.

When the system detects brake overuse, depending on the vehicle manufacturer, a text message will be displayed on the dashboard and an audible alert will be activated.

- Once the brake overuse alert is activated, certain driver interventions that cancel cruise control — like stepping on the brake pedal or switching off cruise — will discontinue the alert. Following an overuse alert, the driver should not reset cruise control for at least 20 minutes. This gives the brakes time to cool down. If the driver chooses to reset cruise control during that 20 minute period, Wingman ACB interventions will be limited to de-throttling and engine retarder only. The system will automatically disable all Wingman ACB system foundation brake applications for at least 20 minutes.
- If the system does not detect a driver intervention within 15 seconds after the brake overuse alert sounds, it will shut itself off and set a Diagnostic Trouble Code (DTC). The driver will continue to receive alerts, but ALL Wingman ACB interventions (de-throttling, engine retarder or brake applications) will be disabled until the next ignition cycle.

Wingman ACB Diagnostic Trouble Codes

The Wingman ACB system is monitored and if any malfunction is detected, a Diagnostic Trouble Code (DTC) will be set and the driver will be alerted. The exact alert given depends on the vehicle manufacturer: refer to your vehicle operator's manual and the Bendix Service Data Sheet SD-13-4962 for more information.

Potential False Alerts

The latest Wingman ACB system should have significantly fewer false alerts than earlier systems. Radar technology is not perfect, and false alerts sometimes occur. Radar misalignment will likely lead to increases in false alerts. Drivers should take into account the road conditions, and

any other factors they are encountering, as they choose how to react to any alerts they receive from the Bendix® Wingman® ACB system.

When Not to Use Cruise Control

The active cruise control and braking feature in Wingman ACB is automatically ready when normal cruise control is set.

This vehicle's cruise control must only be used in the same conditions that are normally recommended for ordinary cruise control. There are certain situations when cruise control should not be used:

Inclement Weather – Do not use cruise control in rain, snow, fog, ice or other severe weather conditions that may affect the performance of the Wingman ACB system.

Dense Traffic – Do not use cruise control in heavy traffic.

Sharp Curves and Winding Roads – Do not use cruise control when traveling sharply curved or winding roadways. **CAUTION: Road curvature may impact the radar's ability to track vehicles ahead in the same lane.**

Entrance or Exit Ramps – Do not use cruise control when entering or exiting roadways.

Downhill Grades – Do not use cruise control on downhill grades.

Construction Zones – Do not use cruise control in construction zones.

Off-Road – Do not use cruise control in off-road conditions.

Smaller Forward Vehicles – Smaller forward vehicles — such as motorcycles — may be difficult for the radar to identify. It is the driver's responsibility to be aware of these types of vehicles and to slow down if necessary.

Visit www.bendix.com for more information and any updates to these limitations and restrictions.

Additional Operational Notes

Adjusting the Alert Volume

The Bendix® Wingman® ACB audible alerts are pre-set at the factory for fully integrated systems and can not be turned off by the driver, nor can the volume be adjusted, unless configured to do so. For systems using a Driver Interface Unit (DIU) display, see the Service Data Sheet (SD-13-4962) for information about volume adjustment.

Passing a Vehicle/Changing Lanes

With cruise control set, if the driver decides to 1) pass a vehicle by applying the throttle; or 2) change lanes the vehicle being passed will no longer be detected by the radar.

When No Other Vehicles are Present

When no forward vehicle is within range of the radar, your vehicle will maintain its set speed just like ordinary cruise control.

Radar-Reflective Stationary Vehicles & Objects

The driver should be attentive to stopped vehicles and objects on the roadway.

⚠ **The Bendix® Wingman® ACB system will give up to three (3) seconds alert time to the driver when approaching a detected, sizable, stationary object with metallic (radar-reflective) surfaces in your lane of travel.**

⚠ The SOA is ready to alert the driver whenever the vehicle is moving above 10 mph (16 km/h). **The SOA is an alert only. No intervention actions (such as de-throttling, engaging the engine retarder or applying the brakes) will be taken. This alert indicates that a collision with a stationary object is likely and the driver must immediately act to potentially avoid — or lessen the severity of — a collision.**

⚠ **Other Metallic Objects –** Other objects that the radar may detect in, or close to, the vehicle's path (such as crash barriers, guard rails, construction zone barricades, tunnel entrances, etc) may impair the function of the radar.

Pedestrians, Animals, Non-Metallic and Limited-Metallic Objects

The Bendix® Wingman® ACB system will not warn or react to pedestrians, animals, and non-metallic objects. The Wingman ACB system may not warn or react to limited-metallic objects (such as recreational vehicles, horse-drawn buggies, motorcycles, logging trailers, etc).

Tracking Vehicles in a Curve

With cruise control set — when following a detected forward vehicle around a curve — the forward vehicle may be lost by the radar. The active cruise control with braking feature will delay acceleration back to the set speed until it regains contact with the vehicle ahead — or detects that there is no longer a vehicle ahead — or after a time gap (based on the last following distance recorded).

For example: Assume cruise control is set at 50 mph (80 km/h) and you are following three (3) seconds behind a vehicle traveling at 45 mph (72 km/h) that just entered a sharp curve. If the vehicle ahead is no longer detected as you travel around the curve, the Wingman ACB system will delay the vehicle acceleration back to 50 mph for three (3) seconds.

The operator should be especially attentive to the Wingman ACB system behavior through curves. In some cases, when traveling around a curve, the radar may lose the vehicle ahead and attempt to accelerate when resuming the set speed.

It is also possible for the Wingman ACB system to begin tracking vehicles in other lanes when traveling around curves. In cases where the Wingman ACB system perceives that an adjacent-lane vehicle is in your lane, the system may intervene and begin making brake applications.

Applying the Brakes Before the System Does

If the driver determines that a hazard or unsafe condition exists, he/she should take all necessary actions immediately. **Never wait for the Wingman ACB system to intervene.**

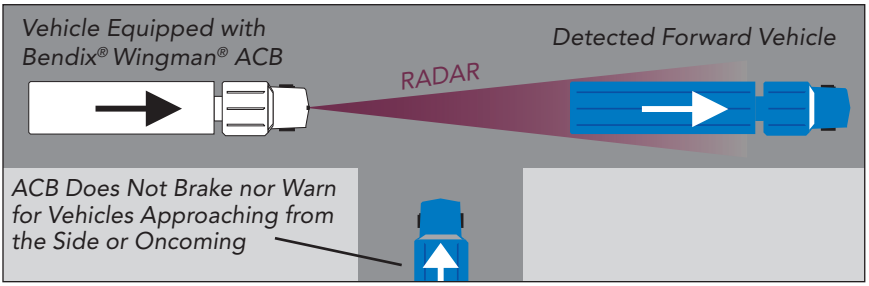
Safe operation and control of the vehicle is the responsibility of the driver at all times. If the driver applies the brakes, cruise control will disengage automatically, and no Wingman ACB intervention will occur.

Approaching Slower Moving Vehicles

When approaching a slower-moving vehicle ahead, the driver should anticipate this and begin applying the vehicle's brakes early. **Do not wait for the Bendix® Wingman® ACB system to intervene.**

Vehicles Crossing Your Path or Coming Towards You

The Bendix Wingman ACB system reacts ONLY to vehicles moving in the same direction as your vehicle. The Wingman ACB system DOES NOT respond to side-to-side moving traffic, or oncoming traffic. The system WILL NOT slow your vehicle or provide an alert as you approach vehicles in these circumstances.


Vehicle Equipped with Bendix® Wingman® ACB
Detected Forward Vehicle
RADAR
ACB Does Not Brake nor Warn for Vehicles Approaching from the Side or Oncoming

Stability System Performance

See the Bendix® ABS/ATC/ESP Operator's Manual included in this vehicle, for details about the stability system.

System Maintenance and Troubleshooting

Importance of Foundation Brake Maintenance – Optimal Wingman ACB system braking requires properly maintained vehicle foundation brakes (drum, wide-drum, or air disc) which meet appropriate safety standards and regulations. Brake performance also requires that the vehicle be equipped with properly sized and inflated tires with a safe tread depth.

Importance of ABS Maintenance – Optimal Wingman ACB system braking requires a properly maintained ABS (Antilock Brake System) system. Have any ABS Diagnostic Trouble Codes (DTCs) corrected by a qualified technician at the earliest opportunity.

Preventive Maintenance:

The Bendix® Wingman® ACB system is relatively maintenance free. The key items to keep the system functioning properly include:

1. Keep the radar lens clean and free of obstructions.
2. Inspect for any damage to the bumper or the Bendix Wingman ACB cover, bracket, or radar to ensure that the alignment has not been compromised. **Never use the radar unit as a step**.
3. Periodically check the radar alignment.
4. Perform appropriate inspections of the braking system as required by the manufacturer to ensure brakes are in proper working order.
5. Ensure that the tires are properly inflated and that adequate tread is present.

When the Bendix® Wingman® ACB System Isn't Working:

⚠ If the Bendix Wingman ACB system has detected a problem, depending on the vehicle manufacturer, there will typically be a warning message on the dashboard display and a Diagnostic Trouble Code (DTC) will be set. The system will determine, depending on the type of problem detected, if the vehicle may continue to have normal cruise control functions (without the benefits of the Wingman ACB system), or if all cruise control functions need to be disabled until servicing is carried out. The system should be serviced as soon as possible to restore full functionality.

Frequently Asked Questions

1. ***Are automatic foundation brake interventions always ready to intervene?***

   No. The Wingman ACB system will only activate the foundation brakes when cruise control is set. The Wingman ACB system does not replace the need for the driver to remain alert, react appropriately and in a timely manner, and use safe driving practices.

2. ***Are the three driver alerts always ready?***

   Yes. All three driver alerts (Impact Alert, Following Distance Alert, and Stationary Object Alert) are always ready to alert the driver — regardless of whether or not cruise control is operating — unless a DTC is set.

Example of Impact Alert Warning display

Example of Following Distance Alert display

Example of Stationary Object Alert display

3. ***How can I tell the difference between the alerts?***

Any audible and/or visual alert by the system means that your vehicle is too close to the vehicle ahead and the driver must immediately act to potentially avoid — or lessen the severity of — a collision.

A solid tone means you should actively apply the brakes because the Bendix® Wingman® ACB braking capability is not enough to ensure a safe following distance. The alerts are audibly different, assisting the driver to pay full attention to the road, not the dash.

4. ***Does the Wingman ACB system detect stationary objects?***

   Yes. The system will give up to three (3) seconds alert time when approaching a detected, sizeable, stationary object with metallic (radar-reflective) surfaces in your lane of travel.

5. ***Can I use an aftermarket "deer guard" on my vehicle?***

   The installation of aftermarket deer guards is not recommended, and could impair the operation of the radar.

Other Information

FCC Part 15

This device complies with part 15 of the FCC Rules with the limits for a Class B digital device and with RSS-210 of Industry Canada. Operation is subject to the following two conditions: (1) this device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation.

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